

WHAT IS CLAIMED IS:

1. A development system for developing computer models for the collection and display of data, the development system comprising:

a component builder that provides functionality for generating reusable components for collecting data from back-end data sources, including back-end data sources associated with business elements, whereby a user may create a reusable component that represents a particular type of business element;

a view builder that provides functionality for generating reusable views that correspond to specific components generated by the component builder, whereby a user can generate one or more views that specify how data collected by a corresponding component is to be displayed, wherein the view builder provides functionality for inserting a view corresponding to a first component within a view corresponding to a second component;

a catalog that contains components generated with the component builder; and

a module that provides functionality for selecting components from the catalog, creating multiple instances of a selected component to represent multiple elements of a common type, and connecting an instance to a respective source of back-end data to allow that instance to collect data.

2. The development system of Claim 1, wherein the component builder provides functionality for generating a component that includes one or more other components generated by the component builder, whereby sub-units of an element are modeled as sub-components of the component representing that element.

3. The development system of Claim 1, wherein the module enables a user to specify a frequency with which data is to be collected from a selected data source.

4. The development system of Claim 1, wherein the module enables a user to separately specify, for each instance of a component, a frequency with which data is to be collected from a corresponding data source.

5. The development system of Claim 1, wherein the component builder provides functionality for generating components that collect point data, relational data, and time series data.

6. The development system of Claim 1, wherein the component builder provides functionality for generating components that collect data structures via application program interface (API) calls.

7. A method of generating a computer model for the collection and display of data, the method comprising:

generating a first reusable software component that collects data from a first type of data source;

generating a first reusable view that specifies how data collected by the first component is to be displayed;

generating a second reusable software component that collects data from a second type of data source, said second component including the first component as a member; and

generating a second reusable view that specifies how data collected by the second component is to be displayed, said second view including the first view such that when a user accesses the second view to view data collected by the second component, the first view is displayed within the second view.

8. The method of Claim 7, wherein the second component represents a plant, and the first component represents an item of machinery within the plant.

9. The method of Claim 7, wherein the second component represents a manufacturing facility, and the first component is configured to collect data describing a status of an element of machinery within the manufacturing facility.

10. The method of Claim 7, wherein the second component represents a business unit, and the first component represents a department of the business unit.

11. The method of Claim 7, further comprising representing the first and second components within a hierarchical navigation structure such that the first component is represented as a child of the second component, said hierarchical navigation structure being browsable by users to view data collected by at least the first and second components.

12. The method of Claim 11, further comprising responding to user selection of the second component within the hierarchical navigation structure by displaying the second view.

13. The method of Claim 7, further comprising creating multiple instances of the second component to represent multiple respective data sources of the second type, each instance of the second component including a respective instance of the first component.

14. The method of Claim 7, wherein the first component collects time series data, and the first view displays said time series data.

15. The method of Claim 7, wherein the first component collects both point data and relational data, and the first view displays said point data and relational data.

16. A computer model generated according to the method of Claim 7 represented within computer storage.

17. A model development system capable of performing the method of Claim 7 to generate a model.

18. A method of generating a computer model for the collection and display of data, the method comprising:

generating a first reusable software component that collects data from a first type of data source;

generating a first reusable view that specifies how data collected by the first component is to be displayed;

creating multiple instances of the first component, each such instance corresponding to a different respective data source of the first type and using the first view to display data collected therefrom; and

connecting each instance of the first component to its respective data source such that at least some of the multiple instances are configured to retrieve data from their respective data sources at different frequencies than others.

19. The method of Claim 18, wherein the method comprises separately specifying a data retrieval frequency for each instance of the first component.

20. The method of Claim 18, wherein connecting each instance of the first component to its respective data source comprises specifying program code for establishing a connection between a data source and an instance of the first component.

21. The method of Claim 18, further comprising generating a second reusable software component that collects data from a second type of data source, said second component including the first component as a member.

22. The method of Claim 21, further comprising generating a second reusable view that specifies how data collected by the second component is to be displayed, said second view including the first view such that when a user accesses the second view to view data collected by an instance of the second component, the second view is displayed within the first view.

23. The method of Claim 21, wherein the second component represents a plant, and the first component represents an item of machinery within the plant.

24. The method of Claim 21, further comprising displaying a navigation interface in which the first component is represented as a child of the second component within a hierarchical node structure, wherein nodes of the hierarchical node structure are selectable to view data collected by corresponding components.

25. A computer model generated according to the method of Claim 18 represented within computer storage.

26. A model development system capable of performing the method of Claim 18 to generate a model.

27. A computer model for the collection and display of data from multiple sources, comprising, within computer storage:

- a plurality of instances of a first reusable component, each instance of the first component including a respective instance of a second reusable component, wherein the first component collects data associated with a first business element and the second component collects data associated with a second business element that is a sub-unit of the first business element;

- a first reusable view that specifies how data collected by instances of the first component is to be displayed, and a second reusable view that specifies how data collected by instances of the second component is to be displayed; and

- a navigation interface that represents each instance of the first component and each instance of the second component as a respective node within a hierarchical node

structure such that each instance of the second component is represented as a child of a respective instance of the first component, wherein each node that represents an instance of the first component is user-selectable by a user to view collected data using said first view, and each node that represents an instance of the second component is user-selectable to view collected data using said second view.

28. The computer model of Claim 27, wherein the second view is included as a component of the first view such that, when the first view displays data collected by an instance of the first component, the second view displays data collected by a corresponding instance of the second component within a display area of the first view.

29. The computer model of Claim 27, wherein the first business element is a plant, and the second business element is an item of machinery within the plant.

30. The computer model of Claim 27, wherein the first component represents a manufacturing facility, and the second component is configured to collect data describing a status of an element of machinery of the manufacturing facility.

31. The computer model of Claim 27, wherein the first component represents a business unit, and the second component represents a department of the business unit.

32. The computer model of Claim 27, wherein the second component is one of a plurality of reusable components that are included within the first component, each of said plurality of reusable components representing a respective business element that is a sub-unit of the first business element.

33. The computer model of Claim 27, wherein at least some instances of the second component are configured to retrieve data using different data retrieval frequencies than other instances of the second component.

34. The computer model of Claim 27, wherein the navigation interface is web based such that users can navigate the hierarchical node structure using a web browser.

35. The computer model of Claim 27, wherein the data collected by the instances of the first reusable component includes time series data.

36. The computer model of Claim 27, wherein the data collected by the instances of the first reusable component includes point data and relational data.

37. The computer model of Claim 27, wherein the data collected by the instances of the first reusable component includes data structures returned from application program interface (API) calls.